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INDIAN ENTOMOLOGY

Descriptions of New Indian Lepidopterous Insects, from the Collection of the Late Mr. W. S. Atkinson, M.A., F.L.S., &c. Part I. *Rhopalocera*, by W. C. Hewitson, F.L.S.; *Heterocera*, by Frederic Moore, Assist. Curator, India Museum. With an Introductory Notice by Arthur Grote, F.Z.S., &c. 4to, pp. 1-88, with Three Coloured Plates. (Calcutta: Published by the Asiatic Society of Bengal, 1879.)

THE hot valleys of the Himalayan regions of our Indian Empire have always justly had especial interest from an entomological point of view. The number of peculiar and apparently strictly endemic, forms of insects already known from this region is great, and principally in the larger species, for even now we know less of the smaller insect-forms of North India than we do of many other less familiar districts not under the advantage of British rule. Indeed, with a few notable exceptions, much of the knowledge we now possess is not precisely of modern origin. The somewhat numerous military expeditions to, and across, the Himalayas, undertaken within the last quarter of a century, and the great recent extension of tea and cinchona plantations in these regions, have not resulted in a corresponding increase in materials for a Himalayan insect-fauna. In some respects it may be said that we are likely to know more of the entomology of the Lake region of Africa, or of the Amazons region of South America, than of a vast and varied district, for the most part under the government of our own countrymen, and of a commercial importance second (to us) to no other. Still, important and wonderful discoveries have been made of late years, but they are perhaps eclipsed by the acknowledged existence of forms discovered long ago which would have become almost traditional were it not that the "types" exist in collections, and that they were duly described and delineated with infinite care in works that are no longer modern. As a summary, then, to the foregoing short introduction to a notice of a modern work on Indian Entomology, it may be briefly stated that a great deal of our knowledge was initiated before the present generation, and has not since been adequately supplemented.

But, as before-mentioned, there have been notable exceptions, and of these the most notable exists in the fruits of the labours of the much-lamented and talented Mr. Atkinson, an entomologist who, before he left this country for India, had acquired a training in entomological pursuits that his keen powers of observation enabled him to use to the best advantage in the intervals of official duties during a long residence in our Eastern Empire. For a very faithful sketch of Mr. Atkinson's career in India, the introductory notice at the commencement of the part of the book now under consideration, from the pen of Mr. Arthur Grote, suffices so far as it goes, and nothing is more to be regretted than the melancholy *finale*. Mr. Atkinson left India on three years' leave, for the purpose of scientifically working out the results of his labours, and died almost suddenly in Italy, before having had time to unpack his stores; and science lost the benefit of what could not have been otherwise than one of the finest original works on Indian entomology that has appeared, or probably ever will appear.

The collections remain (but more or less dispersed); the MS. notes possibly remain also, but they have not been made use of; the more important personal knowledge was buried with its possessor. The collections passed nominally into the hands of the late Mr. Hewitson, but the larger and scientifically more important portions ultimately went to Germany.

So far this notice has been introductory and historical; it remains to refer more particularly to the book. At the outset nothing strikes one as more to be deplored than that Mr. Atkinson himself could not have recorded the results of his labours. In that case we should, without the slightest doubt, have had a complete list of the species observed by him, with copious biological, and comparative faunistic, notes. As it is, we are compelled to put up with a bare mechanical description of the new species, with only a few words on biology, added by Mr. Grote from his long experience in India. The few new butterflies are described by Mr. Hewitson, and this part was probably the last work done by him, the proofs having been corrected on his death-bed. The far more numerous and more important *Heterocera* were confided to the care of Mr. Frederic Moore, by Dr. Staudinger of Dresden, who became their possessor. It would have been impossible to find a more competent entomologist for this task; there is certainly no one who possesses a more exhaustive knowledge of Indian lepidopterous insects. We believe Mr. Moore has commenced, and will finish, the undertaking in the most thoroughly conscientious manner, and this first part treats mainly upon the *Bombyces*, a group in which North India is superabundantly rich, and which Mr. Moore has very closely studied.

If, then, we find fault with the work it is not with especial reference to Mr. Moore (its principal author), but rather to the system pursued, one which is especially the attribute of writers on exotic Lepidoptera, and which will continue so long as lepidopterists are without a general and intelligible generic guide. We find numerous species referred to genera as described by Walker, Felder, &c., and new genera based on characters compared with these. We ask, would it be possible for any entomologist to identify a vast majority of Mr. Walker's generic (or specific) descriptions without referring to the types? and if not, what, from a scientific point of view, is the use of them at all? In the case of Felder ("Reise der *Novara*") it is somewhat different, but the importance is equal. Had that author lived there is little doubt that full and comparative descriptions would have been to hand; as it is, we have little more than an extensive series of beautiful and accurate figures with names applied to them, or with a few words of diagnosis. If our lepidopterists will consent for a few years to an interruption in this interminable and eminently unsatisfactory work of bare "descriptions," and combinedly commence and continue an exhaustive illustrated generic synopsis, they will earn for themselves more fame hereafter than they appear to foresee. Their present system of working only tends daily to render the subject more complicated.

The plates in Part I. of this work are of the greatest excellence so far as they go, and the colouring appears

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to warrant the extreme praise of not being overdone. But we confess to being more pleased with certain parallel plates on the Lepidoptera of the Dutch Indies that have recently appeared in the *Tijdschrift voor Entomologie* (the publication of the Entomological Society of the Netherlands). Our English plates of butterflies and moths too often remind us irresistibly of the sheets of figures of these insects (often beautifully executed) that appear in the shop-windows to be utilised as "scraps," or in any way the purchasers may think fit. That in the majority of cases they serve to identify the species is probable, but they lack the slightest delineation of structural details other than those shown in the general outline of the body and wings. The figures of moths are innocent of legs, innocent of neural details, innocent of palpi (unless these organs be more than usually prominent), and equally innocent of other indications that are now often considered of importance.

Many of the species here described and figured have their evident palæarctic analogues; but, in the absence of a complete list of those found by Mr. Atkinson and other Indian observers, it is impossible to form an idea as to the general nature of the Himalayan lepidopterous fauna.

R. McLACHLAN

MINERAL DEPOSITS

Die Lehre von den Lagerstätten der Erze; ein Zweig der Geologie. Von Dr. Albrecht von Groddeck. 8vo. pp. 350. (Leipzig, 1879.)

IN this volume the phenomena characteristic of mineral deposits are concisely treated in a manner suited for students' use. The descriptive matter is arranged under three heads, the first dealing with the forms of lodes, beds, &c., and their relations to the containing walls or "country" rocks, the second with the contents, or more particularly, with the distribution in the deposits themselves of such contents in the shape of valuable minerals; while the third is a "system of mineral deposits" arranged under different sub-sections, such as original and reconstructed deposits, beds stratified and massive, veins and other deposits filling cracks and hollows, &c.; each particular case being referred to a so-called type bearing a special name. The fourth and final section contains a theory of the origin of mineral deposits in general.

Of the matter contained, much is reproduced from the late Dr. B. von Cotta's "Lehre von der Erzlagerstätten," the last edition of which was published in 1861, the remainder being for the most part derived from papers by various authors that have appeared for the last twenty years, in different German journals, devoted to geological and mining matters.

The principal novelty is the arrangement of the third part, and this is not very satisfactory, the fifty-six types making up the "System" being based partly on structural and partly on topographical considerations, the grouping being too artificial to be of any real geological value. Thus, for example, deposits of chromic iron ore in serpentine are said to belong to the "Wooded Peak" type, because an occurrence of this kind has been reported from a place bearing that not very distinctive name in New Zealand; the famous old mines of Chessy and Montecatini are examples of the Mednorudjansk type, whose "characteristic" is given as follows: "Pyritic ores . . . in unstratified (*massigen*) rocks oftenest Diorite Gabbro and Olivine rocks (serpentine)." This particular deposit, named as the type perhaps better known as the Nishne Tagilsk malachite mine does not, however, occur in unstratified rocks, but in a mass of chloritic, argillaceous, and talcose schists, inclosed in upper Silurian limestones; the author having been led into a mistake by not properly looking up his authorities, the account relied upon being one published in a German journal twelve or thirteen years ago.

In another case, the Tellemarken-Cornwall type, the characteristic is "Lodes in sedimentary rocks, preponderating contents quartz and copper ores in varying proportions, less common are barytes, carbonates, and silicate of zinc, tin-stone, galena, &c." The examples given of this type appear to show that the copper ores of Tellemarken are not in veins in stratified rocks, but in quartz strings in granite dykes, a tolerably common class of occurrence in Scandinavia, and about as much unlike the ordinary type of Cornish lode phenomena as can well be imagined.

Many other examples might be adduced of the incongruities arising from the author's method of classification.

The accounts of the different districts are very disproportionate in value, especially in non-German countries. Thus Cornwall is dismissed in a page and a half, reproduced from Cotta's work, and the whole of the carboniferous limestone lead regions of Central and Northern England are included in a word or two about Derbyshire and Cumberland, the Silurian districts of Wales not receiving any notice. Iron ores are still more capriciously treated, the thin, stratified, spathic and clay band ores of Westphalia taking the first place, while the mighty deposits of Styria are allowed eight lines. No mention is made of either Mokta-el-Hadid, Hodbarrow, or any other of the great mines in the Furness, Ulverstone, or Whitehaven districts, Sommorostro or any other of the Bilbao mines; and, generally speaking, the great sources of supply to the iron-smelters in Western Europe are conspicuous by their absence. Against this we have to set tolerably complete notices of the iron ores of the United States, derived for the most part from Dr. Wedding's Pennsylvanian Exhibition Report.

The work being primarily intended for the use of German students may perhaps account for the circumstance that in the references only German writers are noticed, and this is so completely carried out, that in the few cases where an English or American authority is named, the titles of their works are not given. This is the more to be regretted, as the use of original memoirs might in some cases have prevented the appearance of errors in the text, obviously due to the second-hand sources of information usually relied upon by the author. The careful study of a single good memoir, such as that of the late Prof. Axel Erdmann on the Dannemora Mines, for example, would probably be of more value as a means of preparing a student for recording original observations, than the most complete knowledge of the types of the very artificial system contained in the work.

H. B.

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